WEBVTT

00:00:00.000 --> 00:00:02.148 Funding for Yale Cancer Answers is

NOTE Confidence: 0.807644968181818

00:00:02.148 --> 00:00:04.180 provided by Smilow Cancer Hospital.

NOTE Confidence: 0.80165618

00:00:06.220 --> 00:00:08.446 Welcome to Yale Cancer Answers with

NOTE Confidence: 0.80165618

00:00:08.446 --> 00:00:10.810 your host doctor in Anees Chagpar.

NOTE Confidence: 0.80165618

00:00:10.810 --> 00:00:12.690 Yale Cancer Answers features the

NOTE Confidence: 0.80165618

00:00:12.690 --> 00:00:14.997 latest information on cancer care by

NOTE Confidence: 0.80165618

00:00:14.997 --> 00:00:16.477 welcoming oncologists and specialists

NOTE Confidence: 0.80165618

00:00:16.477 --> 00:00:18.938 who are on the forefront of the

NOTE Confidence: 0.80165618

00:00:18.938 --> 00:00:20.686 battle to fight cancer. This week,

NOTE Confidence: 0.80165618

00:00:20.686 --> 00:00:22.301 it's a conversation about using

NOTE Confidence: 0.80165618

00:00:22.301 --> 00:00:24.080 chemical tools to detect cancer

NOTE Confidence: 0.80165618

00:00:24.080 --> 00:00:25.856 causing proteins with doctor

NOTE Confidence: 0.80165618

00:00:25.856 --> 00:00:27.188 Stavroula Hatzios.

NOTE Confidence: 0.80165618

00:00:27.190 --> 00:00:28.806 Dr Hatzios is assistant

NOTE Confidence: 0.80165618

00:00:28.806 --> 00:00:30.018 professor of molecular,

NOTE Confidence: 0.80165618

00:00:30.020 --> 00:00:31.172 cellular and developmental

NOTE Confidence: 0.80165618

00:00:31.172 --> 00:00:33.476 biology and of chemistry at the

NOTE Confidence: 0.80165618

00:00:33.476 --> 00:00:35.335 Yale School of Medicine where

NOTE Confidence: 0.80165618

00:00:35.335 --> 00:00:37.453 Doctor Chagpar is a professor of

NOTE Confidence: 0.80165618

00:00:37.460 --> 00:00:38.730 Surgical oncology.

NOTE Confidence: 0.889828412916667

00:00:40.230 --> 00:00:42.166 Maybe we can start off

NOTE Confidence: 0.889828412916667

00:00:42.166 --> 00:00:44.381 by you telling us a little bit more

NOTE Confidence: 0.889828412916667

00:00:44.381 --> 00:00:46.260 about yourself and what it is you do.

NOTE Confidence: 0.875286932307692

00:00:46.710 --> 00:00:48.660 My background is in chemistry

NOTE Confidence: 0.875286932307692

00:00:48.660 --> 00:00:50.610 and microbiology so not a

NOTE Confidence: 0.875286932307692

00:00:50.689 --> 00:00:52.750 traditional cancer biologist,

NOTE Confidence: 0.875286932307692

00:00:52.750 --> 00:00:56.215 but I use chemical tools to better

NOTE Confidence: 0.875286932307692

00:00:56.215 --> 00:00:58.255 understand infectious diseases and

NOTE Confidence: 0.875286932307692

00:00:58.255 --> 00:01:00.615 more specifically how microbes can

NOTE Confidence: 0.875286932307692

00:01:00.615 --> 00:01:03.120 contribute to cancer in humans.

NOTE Confidence: 0.875286932307692

00:01:03.120 --> 00:01:06.352 So in my training I started out by

NOTE Confidence: 0.875286932307692

00:01:06.352 --> 00:01:07.870 researching infectious diseases,

NOTE Confidence: 0.875286932307692

00:01:07.870 --> 00:01:09.895 particularly airborne pathogens.

NOTE Confidence: 0.875286932307692

00:01:09.895 --> 00:01:11.920 Like Mycobacterium tuberculosis

NOTE Confidence: 0.875286932307692

00:01:11.920 --> 00:01:14.620 that causes human tuberculosis,

NOTE Confidence: 0.875286932307692

00:01:14.620 --> 00:01:15.840 but then as a postdoc,

NOTE Confidence: 0.875286932307692

00:01:15.840 --> 00:01:18.012 I switched to studying

NOTE Confidence: 0.875286932307692

00:01:18.012 --> 00:01:19.098 gastrointestinal pathogens,

NOTE Confidence: 0.875286932307692

00:01:19.100 --> 00:01:20.156 principally vibrio cholera,

NOTE Confidence: 0.875286932307692

00:01:20.156 --> 00:01:22.268 which is the bacterium that causes

NOTE Confidence: 0.875286932307692

00:01:22.268 --> 00:01:24.070 the diarrheal disease cholera.

NOTE Confidence: 0.875286932307692

00:01:24.070 --> 00:01:25.846 And it was through my postdoctoral

NOTE Confidence: 0.875286932307692

00:01:25.846 --> 00:01:28.184 training that I began to engage in

NOTE Confidence: 0.875286932307692

00:01:28.184 --> 00:01:29.644 conversations with other scientists

NOTE Confidence: 0.875286932307692

00:01:29.644 --> 00:01:31.719 who recommended that I start applying

NOTE Confidence: 0.875286932307692

00:01:31.719 --> 00:01:33.561 some of the chemical tools and

NOTE Confidence: 0.875286932307692

00:01:33.561 --> 00:01:36.060 approaches that I was a developing

NOTE Confidence: 0.875286932307692

00:01:36.060 --> 00:01:37.812 to study comparatively understudied

NOTE Confidence: 0.875286932307692

00:01:37.812 --> 00:01:39.929 microbes like Helicobacter pylori.

NOTE Confidence: 0.875286932307692

00:01:39.930 --> 00:01:42.538 And that was really my entry point into

NOTE Confidence: 0.875286932307692

00:01:42.538 --> 00:01:45.101 the field of cancer microbiology and

NOTE Confidence: 0.875286932307692

00:01:45.101 --> 00:01:46.956 cancer microbiology really refers to

NOTE Confidence: 0.875286932307692

00:01:46.956 --> 00:01:49.340 an area of research that's emerging

NOTE Confidence: 0.875286932307692

00:01:49.340 --> 00:01:51.830 where we're looking at how microbes

NOTE Confidence: 0.875286932307692

00:01:51.830 --> 00:01:54.149 that indigenous microbes in our bodies.

NOTE Confidence: 0.875286932307692

00:01:54.150 --> 00:01:55.982 Which comprise the microbiome,

NOTE Confidence: 0.875286932307692

00:01:55.982 --> 00:01:58.730 as well as infectious microbes that

NOTE Confidence: 0.875286932307692

00:01:58.802 --> 00:02:01.382 cause disease might contribute to the

NOTE Confidence: 0.875286932307692

00:02:01.382 --> 00:02:04.068 development of cancer in humans or

NOTE Confidence: 0.875286932307692

00:02:04.068 --> 00:02:06.298 alter outcomes of cancer therapies.

NOTE Confidence: 0.875286932307692

00:02:06.300 --> 00:02:07.635 So I begin researching Helicobacter

NOTE Confidence: 0.875286932307692

00:02:07.635 --> 00:02:09.479 pylori a little bit as a postdoc,

NOTE Confidence: 0.875286932307692

00:02:09.480 --> 00:02:10.866 and that's really been the focal

NOTE Confidence: 0.875286932307692

00:02:10.866 --> 00:02:12.080 point of my labs work.

NOTE Confidence: 0.875286932307692

00:02:12.080 --> 00:02:14.810 Trying to understand how this very

NOTE Confidence: 0.875286932307692

00:02:14.810 --> 00:02:17.146 important gastric or stomach pathogen

NOTE Confidence: 0.875286932307692

00:02:17.146 --> 00:02:20.618 causes cancer in a subset of infected humans,

NOTE Confidence: 0.875286932307692

00:02:20.620 --> 00:02:22.684 and what are the pathways the

NOTE Confidence: 0.875286932307692

00:02:22.684 --> 00:02:24.560 molecular events by which cancer.

NOTE Confidence: 0.875286932307692

00:02:24.560 --> 00:02:26.681 Develops and we use a lot of

NOTE Confidence: 0.875286932307692

00:02:26.681 --> 00:02:28.390 chemical approaches to sort of

NOTE Confidence: 0.875286932307692

00:02:28.390 --> 00:02:30.220 understand what those pathways are.

NOTE Confidence: 0.885287825833333

00:02:30.710 --> 00:02:33.307 Yeah, so I was going to ask

NOTE Confidence: 0.885287825833333

00:02:33.307 --> 00:02:35.290 something along the same vein.

NOTE Confidence: 0.885287825833333

00:02:35.290 --> 00:02:37.290 Many people, when they think

NOTE Confidence: 0.885287825833333

00:02:37.290 --> 00:02:39.290 about Helicobacter pylori or H.

NOTE Confidence: 0.885287825833333

00:02:39.290 --> 00:02:41.034 Pylori, as it's sometimes

NOTE Confidence: 0.885287825833333

00:02:41.034 --> 00:02:43.054 known we think about ulcers.

NOTE Confidence: 0.885287825833333

00:02:43.054 --> 00:02:45.430 We don't really think about cancer.

NOTE Confidence: 0.885287825833333

00:02:45.430 --> 00:02:47.446 So can you talk a little bit

NOTE Confidence: 0.885287825833333

00:02:47.446 --> 00:02:49.388 more about the link between H.

NOTE Confidence: 0.885287825833333

00:02:49.390 --> 00:02:51.226 Pylori and cancer and how how

NOTE Confidence: 0.885287825833333

00:02:51.226 --> 00:02:52.820 you got started with that?

NOTE Confidence: 0.842478474285714

00:02:54.290 --> 00:02:55.694 Absolutely yeah, H.

NOTE Confidence: 0.842478474285714

00:02:55.694 --> 00:02:57.566 Pylori is a fascinating,

NOTE Confidence: 0.842478474285714

00:02:57.570 --> 00:02:58.602 fascinating microbe.

NOTE Confidence: 0.842478474285714

00:02:58.602 --> 00:03:00.150 As you mentioned,

NOTE Confidence: 0.842478474285714

00:03:00.150 --> 00:03:01.954 it is primarily linked,

NOTE Confidence: 0.842478474285714

00:03:01.954 --> 00:03:04.209 at least in public knowledge,

NOTE Confidence: 0.842478474285714

00:03:04.210 --> 00:03:07.410 to peptic ulcers, stomach inflammation.

NOTE Confidence: 0.842478474285714

00:03:07.410 --> 00:03:09.846 But it's also the leading risk

NOTE Confidence: 0.842478474285714

00:03:09.846 --> 00:03:11.470 factor for gastric cancer,

NOTE Confidence: 0.842478474285714

00:03:11.470 --> 00:03:13.480 which I think currently remains

NOTE Confidence: 0.842478474285714

00:03:13.480 --> 00:03:16.123 the third leading cause of cancer

NOTE Confidence: 0.842478474285714

00:03:16.123 --> 00:03:17.788 related deaths worldwide.

NOTE Confidence: 0.842478474285714

00:03:17.790 --> 00:03:19.644 This is a microbe that's found

NOTE Confidence: 0.842478474285714

00:03:19.644 --> 00:03:22.190 in half of the global population,

NOTE Confidence: 0.842478474285714

00:03:22.190 --> 00:03:25.326 and for most people it it doesn't

NOTE Confidence: 0.842478474285714

00:03:25.326 --> 00:03:26.670 lead to cancer.

NOTE Confidence: 0.842478474285714

00:03:26.670 --> 00:03:28.630 It may actually be innocuous,

NOTE Confidence: 0.842478474285714

00:03:28.630 --> 00:03:30.274 meaning it may not do too

NOTE Confidence: 0.842478474285714

00:03:30.274 --> 00:03:31.730 much to the infected host,

NOTE Confidence: 0.842478474285714

00:03:31.730 --> 00:03:34.266 but a subset of those who carry the

NOTE Confidence: 0.842478474285714

00:03:34.266 --> 00:03:37.070 microbe as a normal part of their

NOTE Confidence: 0.842478474285714

00:03:37.070 --> 00:03:39.170 stomach microbiome will develop peptic

NOTE Confidence: 0.842478474285714

00:03:39.244 --> 00:03:41.448 ulcers and gastric inflammation,

NOTE Confidence: 0.842478474285714

00:03:41.450 --> 00:03:42.330 called gastritis.

NOTE Confidence: 0.842478474285714

00:03:42.330 --> 00:03:44.356 That's roughly 10 to 15%

NOTE Confidence: 0.842478474285714

00:03:44.356 --> 00:03:45.686 of people who have H.

NOTE Confidence: 0.842478474285714

00:03:45.690 --> 00:03:48.084 Pylori and then a much smaller percentage.

NOTE Confidence: 0.842478474285714

00:03:48.090 --> 00:03:50.706 1 to 3% typically go on to develop

NOTE Confidence: 0.842478474285714

00:03:50.706 --> 00:03:52.498 gastric cancer and this connection

NOTE Confidence: 0.842478474285714

00:03:52.498 --> 00:03:55.422 was only made a couple of decades ago

NOTE Confidence: 0.842478474285714

00:03:55.422 --> 00:03:57.654 by Robin Warren and Barry Marshall,

NOTE Confidence: 0.842478474285714

00:03:57.660 --> 00:03:59.876 who won the Nobel Prize in medicine in

NOTE Confidence: 0.842478474285714

00:03:59.880 --> 00:04:02.729 2005 for this discovery that this microbe.

NOTE Confidence: 0.842478474285714

00:04:02.730 --> 00:04:05.074 Can cause peptic ulcers,

NOTE Confidence: 0.842478474285714

00:04:05.074 --> 00:04:07.418 gastric inflammation and ultimately

NOTE Confidence: 0.842478474285714

00:04:07.418 --> 00:04:11.186 cancer and in fact due to their work, H.

NOTE Confidence: 0.842478474285714

00:04:11.186 --> 00:04:12.966 Pylori is now the first,

NOTE Confidence: 0.842478474285714

00:04:12.970 --> 00:04:15.002 formally characterized or classified

NOTE Confidence: 0.842478474285714

00:04:15.002 --> 00:04:19.010 microbe known to be a human carcinogen.

NOTE Confidence: 0.842478474285714

00:04:19.010 --> 00:04:20.768 So in individuals who have H.

NOTE Confidence: 0.842478474285714

00:04:20.770 --> 00:04:21.567 Pylori,

NOTE Confidence: 0.842478474285714

00:04:21.567 --> 00:04:25.552 the microbe can cause chronic

NOTE Confidence: 0.842478474285714

00:04:25.552 --> 00:04:27.710 inflammation of the gastric lining

NOTE Confidence: 0.842478474285714

00:04:27.710 --> 00:04:29.410 and overtime and some hosts.

NOTE Confidence: 0.842478474285714

00:04:29.410 --> 00:04:32.830 This can develop into gastric cancer.

NOTE Confidence: 0.842478474285714

00:04:32.830 --> 00:04:34.582 And what's a major challenge for

NOTE Confidence: 0.842478474285714

00:04:34.582 --> 00:04:37.017 those of us in the field is trying

NOTE Confidence: 0.842478474285714

00:04:37.017 --> 00:04:39.263 to understand why it is that some

NOTE Confidence: 0.842478474285714

00:04:39.263 --> 00:04:41.986 individuals develop cancer and others do not.

NOTE Confidence: 0.842478474285714

00:04:41.990 --> 00:04:44.408 And that's a really important question.

NOTE Confidence: 0.842478474285714

00:04:44.410 --> 00:04:46.312 The reason it's so important is

NOTE Confidence: 0.842478474285714

00:04:46.312 --> 00:04:47.970 that typically if someone has H.

NOTE Confidence: 0.842478474285714

00:04:47.970 --> 00:04:48.431 Pylori.

NOTE Confidence: 0.842478474285714

00:04:48.431 --> 00:04:50.275 You can administer antibiotics

NOTE Confidence: 0.842478474285714

00:04:50.275 --> 00:04:52.580 to get rid of microbe,

NOTE Confidence: 0.842478474285714

00:04:52.580 --> 00:04:54.010 but these microbes have a

NOTE Confidence: 0.842478474285714

00:04:54.010 --> 00:04:55.154 way of evolving very,

NOTE Confidence: 0.842478474285714

00:04:55.160 --> 00:04:57.570 very rapidly and thus they

NOTE Confidence: 0.842478474285714

00:04:57.570 --> 00:04:59.498 they evolve drug resistance,

NOTE Confidence: 0.842478474285714

00:04:59.500 --> 00:05:01.090 which limits the number of drugs

NOTE Confidence: 0.842478474285714

00:05:01.090 --> 00:05:02.879 that we have available to treat them.

NOTE Confidence: 0.842478474285714

00:05:02.880 --> 00:05:04.386 So if you just administer in

NOTE Confidence: 0.842478474285714

00:05:04.386 --> 00:05:05.981 a biotics to half the global

NOTE Confidence: 0.842478474285714

00:05:05.981 --> 00:05:07.577 population to rid them of H.

NOTE Confidence: 0.842478474285714

00:05:07.580 --> 00:05:07.891 Pylori,

NOTE Confidence: 0.842478474285714

00:05:07.891 --> 00:05:10.068 that may not be the best approach

NOTE Confidence: 0.842478474285714

00:05:10.068 --> 00:05:11.834 because you'll fuel the rise

NOTE Confidence: 0.842478474285714

00:05:11.834 --> 00:05:12.917 of antibiotic resistance.

NOTE Confidence: 0.842478474285714

00:05:12.920 --> 00:05:14.755 And there's also some emerging

NOTE Confidence: 0.842478474285714

00:05:14.755 --> 00:05:15.856 thought that H.

NOTE Confidence: 0.842478474285714

00:05:15.860 --> 00:05:17.576 Pylori may actually be beneficial to

NOTE Confidence: 0.842478474285714

00:05:17.576 --> 00:05:19.640 some portion of the population since.

NOTE Confidence: 0.842478474285714

00:05:19.640 --> 00:05:21.268 People carry this microbe,

NOTE Confidence: 0.842478474285714

00:05:21.268 --> 00:05:22.489 usually from childhood,

NOTE Confidence: 0.842478474285714

00:05:22.490 --> 00:05:24.527 and it can help train the immune

NOTE Confidence: 0.842478474285714

00:05:24.527 --> 00:05:26.269 system similarly to how we think

NOTE Confidence: 0.842478474285714

00:05:26.269 --> 00:05:27.883 of other microbes that are found

NOTE Confidence: 0.842478474285714

00:05:27.883 --> 00:05:29.049 in our microbiome.

NOTE Confidence: 0.842478474285714

00:05:29.050 --> 00:05:31.534 So trying to understand whom should

NOTE Confidence: 0.842478474285714

00:05:31.534 --> 00:05:33.587 be treated with antibiotics and

NOTE Confidence: 0.842478474285714

00:05:33.587 --> 00:05:35.841 when who is at risk of developing

NOTE Confidence: 0.842478474285714

00:05:35.841 --> 00:05:37.149 cancer down the line.

NOTE Confidence: 0.842478474285714

00:05:37.150 --> 00:05:38.670 That's a very important question,

NOTE Confidence: 0.842478474285714

00:05:38.670 --> 00:05:40.245 and that's some of what our work

NOTE Confidence: 0.842478474285714

00:05:40.245 --> 00:05:41.660 is focused on understanding.

NOTE Confidence: 0.911280177916667

00:05:42.570 --> 00:05:44.677 So tell us more about that because

NOTE Confidence: 0.911280177916667

00:05:44.677 --> 00:05:46.238 that that clearly is fascinating

NOTE Confidence: 0.911280177916667

00:05:46.238 --> 00:05:48.338 when you think about you know so

NOTE Confidence: 0.911280177916667

00:05:48.338 --> 00:05:50.209 much of the world's population.

NOTE Confidence: 0.911280177916667

00:05:50.210 --> 00:05:53.186 Have this this bacteria you know

NOTE Confidence: 0.911280177916667

00:05:53.186 --> 00:05:55.680 a reasonable proportion of them.

NOTE Confidence: 0.911280177916667

00:05:55.680 --> 00:05:58.242 Get gastritis and ulcers and are

NOTE Confidence: 0.911280177916667

00:05:58.242 --> 00:06:00.620 typically treated with as you say,

NOTE Confidence: 0.911280177916667

00:06:00.620 --> 00:06:05.660 antibiotics and acid reducing medications.

NOTE Confidence: 0.911280177916667

00:06:05.660 --> 00:06:06.840 But there is this subset

NOTE Confidence: 0.911280177916667

00:06:06.840 --> 00:06:08.480 who go on to get cancer.

NOTE Confidence: 0.911280177916667

00:06:08.480 --> 00:06:11.336 So what do we know about that population

NOTE Confidence: 0.911280177916667

00:06:11.336 --> 00:06:14.897 and why it is that they are more

NOTE Confidence: 0.911280177916667

00:06:14.897 --> 00:06:16.741 susceptible to developing malignancy?

NOTE Confidence: 0.878027569565217

00:06:18.160 --> 00:06:20.472 Great question I. I think we don't fully

NOTE Confidence: 0.878027569565217

00:06:20.472 --> 00:06:22.652 know and that's something that a lot

NOTE Confidence: 0.878027569565217

00:06:22.652 --> 00:06:25.080 of research in the field is focused on.

NOTE Confidence: 0.878027569565217

00:06:25.080 --> 00:06:28.032 We have some indications as a field as to

NOTE Confidence: 0.878027569565217

00:06:28.032 --> 00:06:31.168 what might be increasing the risk among

NOTE Confidence: 0.878027569565217

00:06:31.168 --> 00:06:33.938 certain individuals and those can range

NOTE Confidence: 0.878027569565217

00:06:33.938 --> 00:06:36.983 from geography to diet to genetic background,

NOTE Confidence: 0.878027569565217

00:06:36.990 --> 00:06:38.490 but there are challenges also in

NOTE Confidence: 0.878027569565217

00:06:38.490 --> 00:06:40.160 making some of those associations.

NOTE Confidence: 0.878027569565217

00:06:40.160 --> 00:06:42.232 So certainly there are certain parts

NOTE Confidence: 0.878027569565217

00:06:42.232 --> 00:06:44.888 of the world in which the incidence of

NOTE Confidence: 0.878027569565217

00:06:44.888 --> 00:06:47.690 H pylori associated gastric cancer.

NOTE Confidence: 0.878027569565217

00:06:47.690 --> 00:06:50.910 Is higher particular parts of South America?

NOTE Confidence: 0.878027569565217

00:06:50.910 --> 00:06:54.193 For example, there have been studies linking

NOTE Confidence: 0.878027569565217

00:06:54.193 --> 00:06:57.330 altitude to the risk of developing H.

NOTE Confidence: 0.878027569565217

00:06:57.330 --> 00:06:58.578 Pylori associated gastric cancer,

NOTE Confidence: 0.878027569565217

00:06:58.578 --> 00:07:00.990 as well as the amount of salt in

NOTE Confidence: 0.878027569565217

00:07:00.990 --> 00:07:02.663 the diet as well as iron levels.

NOTE Confidence: 0.878027569565217

00:07:02.670 --> 00:07:04.242 So various environmental factors

NOTE Confidence: 0.878027569565217

00:07:04.242 --> 00:07:06.600 are thought to increase risk and

NOTE Confidence: 0.878027569565217

00:07:06.661 --> 00:07:07.801 certainly genetic predisposition

NOTE Confidence: 0.878027569565217

00:07:07.801 --> 00:07:10.461 in some cases may play a role,

NOTE Confidence: 0.878027569565217

00:07:10.470 --> 00:07:12.160 although we don't fully understand

NOTE Confidence: 0.878027569565217

00:07:12.160 --> 00:07:13.850 what those factors may be.

NOTE Confidence: 0.878027569565217

00:07:13.850 --> 00:07:15.776 A challenge there is that the

NOTE Confidence: 0.878027569565217

00:07:15.776 --> 00:07:18.226 microbe is found in such a large

NOTE Confidence: 0.878027569565217

00:07:18.226 --> 00:07:19.686 portion of the population.

NOTE Confidence: 0.878027569565217

00:07:19.690 --> 00:07:22.000 That it can be difficult to identify

NOTE Confidence: 0.878027569565217

00:07:22.000 --> 00:07:23.830 key factors that really predispose

NOTE Confidence: 0.878027569565217

00:07:23.830 --> 00:07:26.146 subset to the development of cancer

NOTE Confidence: 0.878027569565217

00:07:26.146 --> 00:07:28.360 risk and on the microbial side,

NOTE Confidence: 0.878027569565217

00:07:28.360 --> 00:07:30.635 which I haven't really mentioned thus far.

NOTE Confidence: 0.878027569565217

00:07:30.640 --> 00:07:33.377 The Microbit itself has a very complex

NOTE Confidence: 0.878027569565217

00:07:33.377 --> 00:07:35.265 evolutionary history which in and

NOTE Confidence: 0.878027569565217

00:07:35.265 --> 00:07:36.895 of itself is super fascinating.

NOTE Confidence: 0.878027569565217

00:07:36.900 --> 00:07:39.500 It's thought to have Co evolved with humans

NOTE Confidence: 0.878027569565217

00:07:39.500 --> 00:07:42.776 since several thousands of years ago,

NOTE Confidence: 0.878027569565217

00:07:42.780 --> 00:07:43.797 over 60,000 years.

NOTE Confidence: 0.878027569565217

00:07:43.797 --> 00:07:46.880 It's been with humans and thus the phylogeny.

NOTE Confidence: 0.878027569565217

00:07:46.880 --> 00:07:48.304 Basically the evolutionary history.

NOTE Confidence: 0.878027569565217

00:07:48.304 --> 00:07:50.084 How this microbe has evolved.

NOTE Confidence: 0.878027569565217

00:07:50.090 --> 00:07:52.200 Can be used to trace migratory

NOTE Confidence: 0.878027569565217

00:07:52.200 --> 00:07:55.131 patterns of the human, the human race,

NOTE Confidence: 0.878027569565217

00:07:55.131 --> 00:07:57.633 and it's really thought that the

NOTE Confidence: 0.878027569565217

00:07:57.633 --> 00:08:00.367 microbe evolves quite rapidly as well.

NOTE Confidence: 0.878027569565217

00:08:00.370 --> 00:08:02.582 Once it's in a specific human host

NOTE Confidence: 0.878027569565217

00:08:02.582 --> 00:08:05.451 and thus it can be very difficult

NOTE Confidence: 0.878027569565217

00:08:05.451 --> 00:08:07.756 to assign specific microbial genetic

NOTE Confidence: 0.878027569565217

00:08:07.756 --> 00:08:09.459 patterns with cancer risk.

NOTE Confidence: 0.878027569565217

00:08:09.460 --> 00:08:10.309 Although there are,

NOTE Confidence: 0.878027569565217

00:08:10.309 --> 00:08:11.158 I should note,

NOTE Confidence: 0.878027569565217

00:08:11.160 --> 00:08:13.515 some important proteins and genes

NOTE Confidence: 0.878027569565217

00:08:13.515 --> 00:08:15.870 that the microbe carries which

NOTE Confidence: 0.878027569565217

00:08:15.953 --> 00:08:17.436 do correlate very strongly with

NOTE Confidence: 0.878027569565217

00:08:17.436 --> 00:08:19.106 cancer risk in some individuals.

NOTE Confidence: 0.899043505714285

00:08:20.300 --> 00:08:25.814 So, so how do we kind of move that forward?

NOTE Confidence: 0.899043505714285

00:08:25.814 --> 00:08:29.180 I mean when we think about people who

NOTE Confidence: 0.899043505714285

00:08:29.180 --> 00:08:32.148 you know present to their doctor with

NOTE Confidence: 0.899043505714285

00:08:32.148 --> 00:08:35.360 stomach pain and and ulcers and gastritis,

NOTE Confidence: 0.899043505714285

00:08:35.360 --> 00:08:37.170 they generally speaking will have

NOTE Confidence: 0.899043505714285

00:08:37.170 --> 00:08:39.668 an endoscopy and a a small biopsy

NOTE Confidence: 0.899043505714285

00:08:39.668 --> 00:08:42.132 will be taken and sent to the lab

NOTE Confidence: 0.899043505714285

00:08:42.206 --> 00:08:44.216 and the lab will confirm that.

NOTE Confidence: 0.899043505714285

00:08:44.220 --> 00:08:47.148 Yes indeed they have H pylori.

NOTE Confidence: 0.899043505714285

00:08:47.150 --> 00:08:48.694 Is it, you know,

NOTE Confidence: 0.899043505714285

00:08:48.694 --> 00:08:50.624 given what you just mentioned,

NOTE Confidence: 0.899043505714285

00:08:50.630 --> 00:08:52.933 is it possible for that lab instead

NOTE Confidence: 0.899043505714285

00:08:52.933 --> 00:08:55.627 of just saying yes, you have H.

NOTE Confidence: 0.899043505714285

00:08:55.627 --> 00:08:58.381 Pylori to look at the particular

NOTE Confidence: 0.899043505714285

00:08:58.381 --> 00:09:01.010 features of of that particular H.

NOTE Confidence: 0.899043505714285

00:09:01.010 --> 00:09:02.910 Pylori and say well,

NOTE Confidence: 0.899043505714285

00:09:02.910 --> 00:09:05.285 this particular brand of H.

NOTE Confidence: 0.899043505714285

00:09:05.290 --> 00:09:09.301 Pylori has an increased risk of you

NOTE Confidence: 0.899043505714285

00:09:09.301 --> 00:09:11.772 developing gastric cancer versus

NOTE Confidence: 0.899043505714285

00:09:11.772 --> 00:09:16.750 another brand of the same bacteria.

NOTE Confidence: 0.899043505714285

00:09:16.750 --> 00:09:17.400 Yes,

NOTE Confidence: 0.885064073333333

00:09:17.590 --> 00:09:20.086 I do think that that's possible.

NOTE Confidence: 0.885064073333333

00:09:20.090 --> 00:09:22.754 It is possible to culture the

NOTE Confidence: 0.885064073333333

00:09:22.754 --> 00:09:25.042 microbes from from human samples

NOTE Confidence: 0.885064073333333

00:09:25.042 --> 00:09:27.604 and assess at a genetic level

NOTE Confidence: 0.885064073333333

00:09:27.604 --> 00:09:30.210 if the microbe contains these.

NOTE Confidence: 0.885064073333333

00:09:30.210 --> 00:09:31.221 These risk factors,

NOTE Confidence: 0.885064073333333

00:09:31.221 --> 00:09:33.580 and I think that's one possible approach.

NOTE Confidence: 0.885064073333333

00:09:33.580 --> 00:09:34.120 Practically speaking,

NOTE Confidence: 0.885064073333333

00:09:34.120 --> 00:09:35.740 it may be a bit challenging,

NOTE Confidence: 0.885064073333333

00:09:35.740 --> 00:09:38.106 but as we have more advances with

NOTE Confidence: 0.885064073333333

00:09:38.106 --> 00:09:39.962 regards to genome sequencing and

NOTE Confidence: 0.885064073333333

00:09:39.962 --> 00:09:42.657 PCR based methods that can help us

NOTE Confidence: 0.885064073333333

00:09:42.657 --> 00:09:44.570 identify these factors quickly,

NOTE Confidence: 0.885064073333333

00:09:44.570 --> 00:09:46.230 I think that's one approach.

NOTE Confidence: 0.885064073333333

00:09:46.230 --> 00:09:48.869 I think what is maybe more important

NOTE Confidence: 0.885064073333333

00:09:48.869 --> 00:09:52.186 as we move forward in the field is

NOTE Confidence: 0.885064073333333

00:09:52.186 --> 00:09:54.620 trying to identify early risk factors

NOTE Confidence: 0.885064073333333

00:09:54.620 --> 00:09:56.960 because maybe one thing I haven't

NOTE Confidence: 0.885064073333333

00:09:56.960 --> 00:09:58.770 mentioned is that gastric cancer

NOTE Confidence: 0.885064073333333

00:09:58.770 --> 00:10:01.190 tends to present quite later in life,

NOTE Confidence: 0.885064073333333

00:10:01.190 --> 00:10:03.050 so with with regards to H.

NOTE Confidence: 0.885064073333333

00:10:03.050 --> 00:10:03.730 Pylori infection.

NOTE Confidence: 0.885064073333333

00:10:03.730 --> 00:10:04.750 As I mentioned,

NOTE Confidence: 0.885064073333333

00:10:04.750 --> 00:10:06.605 children usually are infected with

NOTE Confidence: 0.885064073333333

00:10:06.605 --> 00:10:08.870 the microbe when they're very young.

NOTE Confidence: 0.885064073333333

00:10:08.870 --> 00:10:10.462 Typically we believe through

NOTE Confidence: 0.885064073333333

00:10:10.462 --> 00:10:12.452 household contacts with other family

NOTE Confidence: 0.885064073333333

00:10:12.452 --> 00:10:14.049 members who have the microbe.

NOTE Confidence: 0.885064073333333

00:10:14.050 --> 00:10:16.367 And it's not until decades later that

NOTE Confidence: 0.885064073333333

00:10:16.367 --> 00:10:18.550 someone would present with gastric cancer.

NOTE Confidence: 0.885064073333333

00:10:18.550 --> 00:10:20.458 So this very there's this very

NOTE Confidence: 0.885064073333333

00:10:20.458 --> 00:10:22.322 long lag phase from, you know,

NOTE Confidence: 0.885064073333333

00:10:22.322 --> 00:10:24.098 the infection in childhood to the

NOTE Confidence: 0.885064073333333

00:10:24.098 --> 00:10:25.510 development of gastric cancer.

NOTE Confidence: 0.885064073333333

00:10:25.510 --> 00:10:27.150 And once it's diagnosed,

NOTE Confidence: 0.885064073333333

00:10:27.150 --> 00:10:29.610 it can be pretty late stage.

NOTE Confidence: 0.885064073333333

00:10:29.610 --> 00:10:31.500 So that's also challenging in

NOTE Confidence: 0.885064073333333

00:10:31.500 --> 00:10:32.634 terms of treatment.

NOTE Confidence: 0.885064073333333

00:10:32.640 --> 00:10:34.536 And so I think what's needed

NOTE Confidence: 0.885064073333333

00:10:34.536 --> 00:10:36.750 are ways to assess much earlier.

NOTE Confidence: 0.885064073333333

00:10:36.750 --> 00:10:38.508 Whether or not someone is at

NOTE Confidence: 0.885064073333333

00:10:38.508 --> 00:10:39.680 risk and one way,

NOTE Confidence: 0.885064073333333

00:10:39.680 --> 00:10:40.400 as you mentioned,

NOTE Confidence: 0.885064073333333

00:10:40.400 --> 00:10:41.840 could be looking at the microbe

NOTE Confidence: 0.885064073333333

00:10:41.840 --> 00:10:42.679 and then others.

NOTE Confidence: 0.885064073333333

00:10:42.680 --> 00:10:44.720 Others may be trying to identify.

NOTE Confidence: 0.885064073333333

00:10:44.720 --> 00:10:48.302 Host factors that may be indicative

NOTE Confidence: 0.885064073333333

00:10:48.302 --> 00:10:50.688 of of infections that may be heading

NOTE Confidence: 0.885064073333333

00:10:50.688 --> 00:10:52.320 down the road towards cancer,

NOTE Confidence: 0.885064073333333

00:10:52.320 --> 00:10:54.200 and that's what I think a lot of

NOTE Confidence: 0.885064073333333

00:10:54.200 --> 00:10:56.018 research in this area is focused on,

NOTE Confidence: 0.885064073333333

00:10:56.020 --> 00:10:57.455 including the work of my own lab,

NOTE Confidence: 0.885064073333333

00:10:57.460 --> 00:10:59.572 is trying to identify effects that

NOTE Confidence: 0.885064073333333

00:10:59.572 --> 00:11:01.807 microbes may have on the host

NOTE Confidence: 0.885064073333333

00:11:01.807 --> 00:11:04.075 that could be translated into new

NOTE Confidence: 0.885064073333333

00:11:04.075 --> 00:11:05.688 diagnostic tests and indications

NOTE Confidence: 0.885064073333333

00:11:05.688 --> 00:11:07.268 of early cancer risk.

NOTE Confidence: 0.904852646666667

00:11:08.240 --> 00:11:10.688 So, so tell us more about that in terms

NOTE Confidence: 0.904852646666667

00:11:10.688 --> 00:11:13.416 of the work that's going on in your lab,

NOTE Confidence: 0.79775133

00:11:13.920 --> 00:11:16.968 sure, so. What we're trying to do is

NOTE Confidence: 0.79775133

00:11:16.968 --> 00:11:20.150 excuse me, is trying to understand.

NOTE Confidence: 0.79775133

00:11:20.150 --> 00:11:22.520 How infection alters proteins in cells

NOTE Confidence: 0.79775133

00:11:22.520 --> 00:11:26.087 that are found in the stomach in a in a

NOTE Confidence: 0.79775133

00:11:26.087 --> 00:11:28.349 manner that may promote tumor growth.

NOTE Confidence: 0.79775133

00:11:28.350 --> 00:11:30.954 So how is it that the microbe

NOTE Confidence: 0.79775133

00:11:30.954 --> 00:11:32.810 interfaces with human proteins?

NOTE Confidence: 0.79775133

00:11:32.810 --> 00:11:34.182 How do they alter?

NOTE Confidence: 0.79775133

00:11:34.182 --> 00:11:36.240 How do those interactions alter the

NOTE Confidence: 0.79775133

00:11:36.313 --> 00:11:39.162 proteins behavior in a manner that could

NOTE Confidence: 0.79775133

00:11:39.162 --> 00:11:41.089 promote the development of cancer,

NOTE Confidence: 0.79775133

00:11:41.090 --> 00:11:42.994 so to break it down a bit when

NOTE Confidence: 0.79775133

00:11:42.994 --> 00:11:44.629 when you have an infection,

NOTE Confidence: 0.79775133

00:11:44.630 --> 00:11:46.010 your body's immune system will

NOTE Confidence: 0.79775133

00:11:46.010 --> 00:11:48.116 respond to try to clear the infection

NOTE Confidence: 0.79775133

00:11:48.116 --> 00:11:49.781 and that that generally involves

NOTE Confidence: 0.79775133

00:11:49.781 --> 00:11:51.500 the recruitment of immune cells.

NOTE Confidence: 0.79775133

00:11:51.500 --> 00:11:53.474 And these immune cells will produce

NOTE Confidence: 0.79775133

00:11:53.474 --> 00:11:55.918 a lot of oxidants or free radicals.

NOTE Confidence: 0.79775133

00:11:55.920 --> 00:11:57.930 These are small molecules that

NOTE Confidence: 0.79775133

00:11:57.930 --> 00:11:59.136 are very reactive.

NOTE Confidence: 0.79775133

00:11:59.140 --> 00:12:00.358 They contain a lot of oxygen.

NOTE Confidence: 0.79775133

00:12:00.360 --> 00:12:01.648 They're starved for electrons,

NOTE Confidence: 0.79775133

00:12:01.648 --> 00:12:03.580 so they react very readily with

NOTE Confidence: 0.79775133

00:12:03.639 --> 00:12:05.199 other molecules in your cells,

NOTE Confidence: 0.79775133

00:12:05.200 --> 00:12:06.754 and they can cause damage to cells.

NOTE Confidence: 0.79775133

00:12:06.760 --> 00:12:09.032 Because of this intrinsic

NOTE Confidence: 0.79775133

00:12:09.032 --> 00:12:10.168 chemical reactivity.

NOTE Confidence: 0.79775133

00:12:10.170 --> 00:12:12.501 And one of the major classes of

NOTE Confidence: 0.79775133

00:12:12.501 --> 00:12:14.664 biomolecules that can get damaged by

NOTE Confidence: 0.79775133

00:12:14.664 --> 00:12:16.854 these oxidants or proteins and proteins

NOTE Confidence: 0.79775133

00:12:16.854 --> 00:12:18.616 are super important because they

NOTE Confidence: 0.79775133

00:12:18.616 --> 00:12:20.970 do a lot of chemistry in ourselves.

NOTE Confidence: 0.79775133

00:12:20.970 --> 00:12:22.370 They they generate energy,

NOTE Confidence: 0.79775133

00:12:22.370 --> 00:12:23.558 they help cells grow.

NOTE Confidence: 0.79775133

00:12:23.558 --> 00:12:24.746 They help them divide.

NOTE Confidence: 0.79775133

00:12:24.750 --> 00:12:26.490 They provide structure to cells.

NOTE Confidence: 0.79775133

00:12:26.490 --> 00:12:28.896 They help mediate interactions between cells,

NOTE Confidence: 0.79775133

00:12:28.900 --> 00:12:31.245 and these are all very important processes

NOTE Confidence: 0.79775133

00:12:31.245 --> 00:12:33.539 that if they become dysregulated,

NOTE Confidence: 0.79775133

00:12:33.540 --> 00:12:35.610 so if they're interrupted or inhibited,

NOTE Confidence: 0.79775133

00:12:35.610 --> 00:12:37.090 messed with in some way,

NOTE Confidence: 0.79775133

00:12:37.090 --> 00:12:40.514 they could lead to the development of cancer.

NOTE Confidence: 0.79775133

00:12:40.520 --> 00:12:42.788 And So what we're trying to understand

NOTE Confidence: 0.79775133

00:12:42.788 --> 00:12:45.285 is when you have an infection and

NOTE Confidence: 0.79775133

00:12:45.285 --> 00:12:47.463 all of these oxidants are produced

NOTE Confidence: 0.79775133

00:12:47.536 --> 00:12:48.900 by the immune system,

NOTE Confidence: 0.79775133

00:12:48.900 --> 00:12:51.595 some of those oxidants will damage proteins.

NOTE Confidence: 0.79775133

00:12:51.600 --> 00:12:53.640 And when those proteins get damaged,

NOTE Confidence: 0.79775133

00:12:53.640 --> 00:12:56.636 do they alter some of these processes

NOTE Confidence: 0.79775133

00:12:56.636 --> 00:12:59.108 that could encourage cancer to form?

NOTE Confidence: 0.79775133

00:12:59.110 --> 00:13:01.486 If that's the case in our data points,

NOTE Confidence: 0.79775133

00:13:01.490 --> 00:13:03.510 to indicates that that is.

NOTE Confidence: 0.79775133

00:13:03.510 --> 00:13:05.530 Then can we identify you?

NOTE Confidence: 0.79775133

00:13:05.530 --> 00:13:07.660 Some of these proteins as new

NOTE Confidence: 0.79775133

00:13:07.660 --> 00:13:09.450 diagnostic markers of cancer risk?

NOTE Confidence: 0.79775133

00:13:09.450 --> 00:13:11.100 So if these proteins are getting

NOTE Confidence: 0.79775133

00:13:11.100 --> 00:13:11.925 damaged early on,

NOTE Confidence: 0.79775133

00:13:11.930 --> 00:13:13.869 can we use them as indicators that

NOTE Confidence: 0.79775133

00:13:13.869 --> 00:13:15.691 cancer may be maybe more likely

NOTE Confidence: 0.79775133

00:13:15.691 --> 00:13:16.615 down the line?

NOTE Confidence: 0.91383240125

00:13:17.050 --> 00:13:19.416 Yeah, so I was just about to say, I mean,

NOTE Confidence: 0.91383240125

00:13:19.416 --> 00:13:21.181 that sounds like just fascinating

NOTE Confidence: 0.91383240125

00:13:21.181 --> 00:13:23.569 work and and I'd really like to

NOTE Confidence: 0.91383240125

00:13:23.569 --> 00:13:25.850 dig a little deeper into into that.

NOTE Confidence: 0.91383240125

00:13:25.850 --> 00:13:27.488 But first we have to take a

NOTE Confidence: 0.91383240125

00:13:27.488 --> 00:13:29.179 short break for a medical minute.

NOTE Confidence: 0.91383240125

00:13:29.180 --> 00:13:31.833 So please stay tuned to learn more

NOTE Confidence: 0.91383240125

00:13:31.833 --> 00:13:33.800 information about research and to

NOTE Confidence: 0.91383240125

00:13:33.800 --> 00:13:35.316 detecting cancer causing proteins

NOTE Confidence: 0.91383240125

00:13:35.316 --> 00:13:37.899 with my guest doctor Stavroula Hatzios.

NOTE Confidence: 0.832647365238095

00:13:38.320 --> 00:13:40.685 Funding for Yale Cancer Answers

NOTE Confidence: 0.832647365238095

00:13:40.685 --> 00:13:43.050 comes from Smilow Cancer Hospital

NOTE Confidence: 0.832647365238095

00:13:43.130 --> 00:13:45.315 hosting a Smilow shares cancer

NOTE Confidence: 0.832647365238095

00:13:45.315 --> 00:13:47.940 survivors series June 22nd and 29th.

NOTE Confidence: 0.832647365238095

00:13:47.940 --> 00:13:50.806 Register at yalecancercenter.org or

NOTE Confidence: 0.832647365238095

00:13:50.806 --> 00:13:55.200 e-mail cancer answers at yale.edu.

NOTE Confidence: 0.832647365238095

00:13:55.200 --> 00:13:57.365 Over 230,000 Americans will be

NOTE Confidence: 0.832647365238095

00:13:57.365 --> 00:13:59.530 diagnosed with lung cancer this

NOTE Confidence: 0.832647365238095

00:13:59.604 --> 00:14:01.464 year and in Connecticut alone

NOTE Confidence: 0.832647365238095

00:14:01.464 --> 00:14:04.532 there will be over 2700 new cases.

NOTE Confidence: 0.832647365238095

00:14:04.532 --> 00:14:07.048 More than 85% of lung cancer

NOTE Confidence: 0.832647365238095

00:14:07.048 --> 00:14:09.250 diagnosis are related to smoking and

NOTE Confidence: 0.832647365238095

00:14:09.326 --> 00:14:11.894 quitting even after decades of use

NOTE Confidence: 0.832647365238095

00:14:11.894 --> 00:14:14.074 can significantly reduce your risk

NOTE Confidence: 0.832647365238095

00:14:14.074 --> 00:14:16.374 of developing lung cancer each day.

NOTE Confidence: 0.832647365238095

00:14:16.374 --> 00:14:18.456 Patients with lung cancer are surviving

NOTE Confidence: 0.832647365238095

00:14:18.456 --> 00:14:20.974 thanks to increased access to advanced

NOTE Confidence: 0.832647365238095

00:14:20.974 --> 00:14:22.738 therapies and specialized care,

NOTE Confidence: 0.832647365238095

00:14:22.740 --> 00:14:24.100 new treatment options and

NOTE Confidence: 0.832647365238095

00:14:24.100 --> 00:14:25.460 surgical techniques are giving.

NOTE Confidence: 0.832647365238095

00:14:25.460 --> 00:14:27.050 Lung cancer survivors more hope

NOTE Confidence: 0.832647365238095

00:14:27.050 --> 00:14:29.110 than they have ever had before.

NOTE Confidence: 0.832647365238095

00:14:29.110 --> 00:14:31.042 Clinical trials are currently

NOTE Confidence: 0.832647365238095

00:14:31.042 --> 00:14:32.974 underway at federally designated

NOTE Confidence: 0.832647365238095

00:14:32.974 --> 00:14:34.470 Comprehensive cancer centers,

NOTE Confidence: 0.832647365238095

00:14:34.470 --> 00:14:36.675 such as the battle two trial at

NOTE Confidence: 0.832647365238095

00:14:36.675 --> 00:14:38.292 Yale Cancer Center and Smilow

NOTE Confidence: 0.832647365238095

00:14:38.292 --> 00:14:40.406 Cancer Hospital to learn if a drug

NOTE Confidence: 0.832647365238095

00:14:40.406 --> 00:14:42.701 or combination of drugs based on

NOTE Confidence: 0.832647365238095

00:14:42.701 --> 00:14:44.621 personal biomarkers can help to

NOTE Confidence: 0.832647365238095

00:14:44.630 --> 00:14:47.366 control non small cell lung cancer.

NOTE Confidence: 0.832647365238095

00:14:47.370 --> 00:14:50.330 More information is available at

NOTE Confidence: 0.832647365238095

00:14:50.330 --> 00:14:51.590 yalecancercenter.org you're listening

NOTE Confidence: 0.832647365238095

00:14:51.590 --> 00:14:53.270 to Connecticut Public Radio.

NOTE Confidence: 0.813671413333333

00:14:54.440 --> 00:14:56.498 Welcome back to Yale Cancer Answers.

NOTE Confidence: 0.813671413333333

00:14:56.500 --> 00:14:59.028 I'm doctor Anees Chagpar and I'm joined

NOTE Confidence: 0.813671413333333

00:14:59.028 --> 00:15:01.839 tonight by my guest doctor Stavroula Hatzios.

NOTE Confidence: 0.813671413333333

00:15:01.840 --> 00:15:03.832 We're discussing some of her recent

NOTE Confidence: 0.813671413333333

00:15:03.832 --> 00:15:05.716 research and right before the break

NOTE Confidence: 0.813671413333333

00:15:05.716 --> 00:15:07.716 she was starting to tell us about H.

NOTE Confidence: 0.813671413333333

00:15:07.720 --> 00:15:09.310 Pylori. Now, for those of

NOTE Confidence: 0.813671413333333

00:15:09.310 --> 00:15:11.160 you who are just joining us,

NOTE Confidence: 0.813671413333333

00:15:11.160 --> 00:15:12.564 you know each pylori.

NOTE Confidence: 0.813671413333333

00:15:12.564 --> 00:15:15.106 It's that bacteria that sits in your

NOTE Confidence: 0.813671413333333

00:15:15.106 --> 00:15:17.714 stomach and that causes ulcers and gastritis.

NOTE Confidence: 0.813671413333333

00:15:17.714 --> 00:15:19.290 And things like that.

NOTE Confidence: 0.813671413333333

00:15:19.290 --> 00:15:22.097 And we never really think about it

NOTE Confidence: 0.813671413333333

00:15:22.097 --> 00:15:25.050 necessarily as being associated with cancer.

NOTE Confidence: 0.813671413333333

00:15:25.050 --> 00:15:27.738 However, Savula tells us that it's actually

NOTE Confidence: 0.813671413333333

00:15:27.738 --> 00:15:31.000 a leading cause of gastric cancer and

NOTE Confidence: 0.813671413333333

00:15:31.000 --> 00:15:34.010 the mechanism for that is something that

NOTE Confidence: 0.813671413333333

00:15:34.010 --> 00:15:37.889 she and her lab is working on discovering

NOTE Confidence: 0.813671413333333

00:15:37.889 --> 00:15:40.429 because not everybody who has H.

NOTE Confidence: 0.813671413333333

00:15:40.430 --> 00:15:42.010 Pylori gets gastric cancer.

NOTE Confidence: 0.813671413333333

00:15:42.010 --> 00:15:44.650 Thank goodness, but some people do.

NOTE Confidence: 0.813671413333333

00:15:44.650 --> 00:15:46.684 And so stavroula right before the

NOTE Confidence: 0.813671413333333

00:15:46.684 --> 00:15:49.072 break you were telling us that one

NOTE Confidence: 0.813671413333333

00:15:49.072 --> 00:15:51.010 of the potential mechanisms of this,

NOTE Confidence: 0.813671413333333

00:15:51.010 --> 00:15:53.178 if I understood correctly,

NOTE Confidence: 0.813671413333333

00:15:53.178 --> 00:15:55.346 is that with this.

NOTE Confidence: 0.813671413333333

00:15:55.350 --> 00:15:58.440 Infection with this H pylori your

NOTE Confidence: 0.813671413333333

00:15:58.440 --> 00:16:01.500 immune system starts to kind of

NOTE Confidence: 0.813671413333333

00:16:01.500 --> 00:16:03.308 act on that infection.

NOTE Confidence: 0.813671413333333

00:16:03.310 --> 00:16:05.740 It it kind of gets geared up as it

NOTE Confidence: 0.813671413333333

00:16:05.740 --> 00:16:08.138 would to any infection and starts

NOTE Confidence: 0.813671413333333

00:16:08.138 --> 00:16:11.042 manipulating some proteins and that those

NOTE Confidence: 0.813671413333333

00:16:11.042 --> 00:16:13.362 proteins might actually signal cancer.

NOTE Confidence: 0.813671413333333

00:16:13.362 --> 00:16:14.400 Is that right?

NOTE Confidence: 0.904569711111111

00:16:15.510 --> 00:16:17.030 Yes, that's what we believe

NOTE Confidence: 0.904569711111111

00:16:17.030 --> 00:16:18.246 and what we're investigating,

NOTE Confidence: 0.904569711111111

00:16:18.250 --> 00:16:21.355 and so we think that a lot of the

NOTE Confidence: 0.904569711111111

00:16:21.355 --> 00:16:23.347 inflammation that occurs during H.

NOTE Confidence: 0.904569711111111

00:16:23.350 --> 00:16:25.575 Pylori infection, which is accompanied

NOTE Confidence: 0.904569711111111

00:16:25.575 --> 00:16:27.800 by the production of oxidants.

NOTE Confidence: 0.904569711111111

00:16:27.800 --> 00:16:29.156 Those small molecules

NOTE Confidence: 0.904569711111111

00:16:29.156 --> 00:16:30.964 that are highly reactive,

NOTE Confidence: 0.904569711111111

00:16:30.970 --> 00:16:33.896 leads to changes in your cells, the proteins,

NOTE Confidence: 0.904569711111111

00:16:33.896 --> 00:16:37.487 the DNA that helps nucleate cancer formation,

NOTE Confidence: 0.904569711111111

00:16:37.490 --> 00:16:38.534 and as you mentioned,

NOTE Confidence: 0.904569711111111

00:16:38.534 --> 00:16:39.839 we're focusing on the proteins.

NOTE Confidence: 0.904569711111111

00:16:39.840 --> 00:16:42.178 How do those change in a way

NOTE Confidence: 0.904569711111111

00:16:42.178 --> 00:16:44.229 that may promote tumor growth?

NOTE Confidence: 0.904569711111111

00:16:44.230 --> 00:16:45.974 Our lab is using.

NOTE Confidence: 0.904569711111111

00:16:45.974 --> 00:16:48.154 Some advanced chemical tools that

NOTE Confidence: 0.904569711111111

00:16:48.154 --> 00:16:50.531 allow us to identify specific

NOTE Confidence: 0.904569711111111

00:16:50.531 --> 00:16:52.861 proteins and human gastric cells

NOTE Confidence: 0.904569711111111

00:16:52.861 --> 00:16:55.705 that get damaged or modified by

NOTE Confidence: 0.904569711111111

00:16:55.705 --> 00:16:58.000 these oxidants produced during H.

NOTE Confidence: 0.904569711111111

00:16:58.000 --> 00:16:58.730 Pylori infection,

NOTE Confidence: 0.904569711111111

00:16:58.730 --> 00:17:01.285 so we can basically canvas the whole

NOTE Confidence: 0.904569711111111

00:17:01.285 --> 00:17:03.416 cell with these chemical tools and

NOTE Confidence: 0.904569711111111

00:17:03.416 --> 00:17:05.586 say what proteins are you getting

NOTE Confidence: 0.904569711111111

00:17:05.586 --> 00:17:07.998 modified by these oxidants and then

NOTE Confidence: 0.904569711111111

00:17:07.998 --> 00:17:10.138 independently look at these proteins

NOTE Confidence: 0.904569711111111

00:17:10.138 --> 00:17:12.458 using biochemistry and some biology.

NOTE Confidence: 0.904569711111111

00:17:12.460 --> 00:17:13.630 Other very interesting

NOTE Confidence: 0.904569711111111

00:17:13.630 --> 00:17:15.970 tools in our toolkit to ask.

NOTE Confidence: 0.904569711111111

00:17:15.970 --> 00:17:18.064 What happens when these proteins are

NOTE Confidence: 0.904569711111111

00:17:18.064 --> 00:17:20.250 modified that may promote tumor growth,

NOTE Confidence: 0.904569711111111

00:17:20.250 --> 00:17:22.245 and for that we use a number

NOTE Confidence: 0.904569711111111

00:17:22.245 --> 00:17:23.650 of different model systems,

NOTE Confidence: 0.904569711111111

00:17:23.650 --> 00:17:25.770 both in the lab and using a number

NOTE Confidence: 0.904569711111111

00:17:25.770 --> 00:17:27.675 of other different systems to look

NOTE Confidence: 0.904569711111111

00:17:27.675 --> 00:17:30.103 at tumor growth as a result of

NOTE Confidence: 0.904569711111111

00:17:30.103 --> 00:17:32.108 these modifications to the proteins,

NOTE Confidence: 0.904569711111111

00:17:32.110 --> 00:17:34.728 the long term goal here is to

NOTE Confidence: 0.904569711111111

00:17:34.728 --> 00:17:36.286 identify modified proteins that

NOTE Confidence: 0.904569711111111

00:17:36.286 --> 00:17:38.488 could be used to diagnose cancer

NOTE Confidence: 0.904569711111111

00:17:38.488 --> 00:17:40.729 risk much earlier in an infection.

NOTE Confidence: 0.904569711111111

00:17:40.730 --> 00:17:41.818 So you might imagine,

NOTE Confidence: 0.904569711111111

00:17:41.818 --> 00:17:42.906 as you mentioned previously,

NOTE Confidence: 0.904569711111111

00:17:42.910 --> 00:17:45.565 if someone presents at a clinic with an H.

NOTE Confidence: 0.904569711111111

00:17:45.570 --> 00:17:46.418 Pylori infection,

NOTE Confidence: 0.904569711111111

00:17:46.418 --> 00:17:49.386 maybe there could be a biopsy taken

NOTE Confidence: 0.904569711111111

00:17:49.386 --> 00:17:51.672 where we look specifically for

NOTE Confidence: 0.904569711111111

00:17:51.672 --> 00:17:54.710 proteins that we've identified in the lab.

NOTE Confidence: 0.904569711111111

00:17:54.710 --> 00:17:57.134 Promote tumor growth and see if

NOTE Confidence: 0.904569711111111

00:17:57.134 --> 00:17:59.899 those have been changed in a way

NOTE Confidence: 0.904569711111111

00:17:59.899 --> 00:18:01.689 that aligns with that outcome.

NOTE Confidence: 0.904569711111111

00:18:01.690 --> 00:18:04.308 And if you can detect those small

NOTE Confidence: 0.904569711111111

00:18:04.308 --> 00:18:06.257 molecular changes very early in

NOTE Confidence: 0.904569711111111

00:18:06.257 --> 00:18:08.537 an infection that that may help

NOTE Confidence: 0.904569711111111

00:18:08.537 --> 00:18:10.639 improve outcomes on the patient side

NOTE Confidence: 0.706301534

00:18:11.010 --> 00:18:14.148 so that that's an interesting theory

NOTE Confidence: 0.706301534

00:18:14.148 --> 00:18:16.176 stavroula, but one of the things

NOTE Confidence: 0.706301534

00:18:16.176 --> 00:18:18.250 that you mentioned before the break,

NOTE Confidence: 0.706301534

00:18:18.250 --> 00:18:20.679 which is true, is that there is

NOTE Confidence: 0.706301534

00:18:20.679 --> 00:18:23.060 this lag time right between when

NOTE Confidence: 0.706301534

00:18:23.060 --> 00:18:24.810 you get an infection when you have.

NOTE Confidence: 0.706301534

00:18:24.810 --> 00:18:27.474 Gastritis and when you may ultimately

NOTE Confidence: 0.706301534

00:18:27.474 --> 00:18:29.880 end up with gastric cancer,

NOTE Confidence: 0.706301534

00:18:29.880 --> 00:18:33.600 are there ways that we can manipulate these

NOTE Confidence: 0.706301534

00:18:33.600 --> 00:18:38.054 proteins or or reduce risk in some way?

NOTE Confidence: 0.706301534

00:18:38.060 --> 00:18:40.170 Once we identify these proteins,

NOTE Confidence: 0.84304463

00:18:41.340 --> 00:18:43.938 right? That is absolutely the goal.

NOTE Confidence: 0.84304463

00:18:43.940 --> 00:18:46.328 So not only could such proteins

NOTE Confidence: 0.84304463

00:18:46.328 --> 00:18:48.879 serve as indicators of cancer risk,

NOTE Confidence: 0.84304463

00:18:48.880 --> 00:18:51.016 but the nice thing about proteins,

NOTE Confidence: 0.84304463

00:18:51.020 --> 00:18:52.370 and particularly a lot of

NOTE Confidence: 0.84304463

00:18:52.370 --> 00:18:53.720 the proteins that we study,

NOTE Confidence: 0.84304463

00:18:53.720 --> 00:18:56.000 is that a lot of them carry enzymatic.

NOTE Confidence: 0.84304463

00:18:56.000 --> 00:18:57.080 Function so there are enzymes.

NOTE Confidence: 0.84304463

00:18:57.080 --> 00:18:58.622 That means that they can perform

NOTE Confidence: 0.84304463

00:18:58.622 --> 00:18:59.920 different chemistry in the cell.

NOTE Confidence: 0.84304463

00:18:59.920 --> 00:19:02.284 They can perform chemical reactions and

NOTE Confidence: 0.84304463

00:19:02.284 --> 00:19:05.073 those are proteins that are really nicely

NOTE Confidence: 0.84304463

00:19:05.073 --> 00:19:07.365 targeted by small molecules by drugs.

NOTE Confidence: 0.84304463

00:19:07.370 --> 00:19:09.734 And thus if if these proteins

NOTE Confidence: 0.84304463

00:19:09.734 --> 00:19:12.319 that are involved in the infection

NOTE Confidence: 0.84304463

00:19:12.319 --> 00:19:14.629 response and down the line,

NOTE Confidence: 0.84304463

00:19:14.630 --> 00:19:16.195 increasing the risk of tumor

NOTE Confidence: 0.84304463

00:19:16.195 --> 00:19:18.170 growth can be targeted by drugs,

NOTE Confidence: 0.84304463

00:19:18.170 --> 00:19:20.336 then you also have the opportunity

NOTE Confidence: 0.84304463

00:19:20.336 --> 00:19:21.780 to develop new chemotherapeutics

NOTE Confidence: 0.84304463

00:19:21.838 --> 00:19:23.428 that could help actually treat

NOTE Confidence: 0.84304463

00:19:23.428 --> 00:19:25.018 cancers that result down the

NOTE Confidence: 0.84304463

00:19:25.074 --> 00:19:26.530 line from these infections.

NOTE Confidence: 0.84304463

00:19:26.530 --> 00:19:28.858 So not only are the proteins

NOTE Confidence: 0.84304463

00:19:28.858 --> 00:19:30.410 important as diagnostic indicators,

NOTE Confidence: 0.84304463

00:19:30.410 --> 00:19:32.312 but also carry the potential to

NOTE Confidence: 0.84304463

00:19:32.312 --> 00:19:34.479 be new drug targets for actually

NOTE Confidence: 0.84304463

00:19:34.479 --> 00:19:36.139 treating the cancer itself.

NOTE Confidence: 0.911688106875

00:19:36.330 --> 00:19:38.227 Wouldn't it be better if we were

NOTE Confidence: 0.911688106875

00:19:38.227 --> 00:19:39.929 able to somehow manipulate these

NOTE Confidence: 0.911688106875

00:19:39.929 --> 00:19:41.585 proteins to prevent cancer?

NOTE Confidence: 0.911688106875

00:19:41.590 --> 00:19:43.198 Is that something that's

NOTE Confidence: 0.911688106875

00:19:43.198 --> 00:19:45.310 being looked at? Yes, I think

NOTE Confidence: 0.88395999

00:19:45.320 --> 00:19:47.390 we're not quite there yet.

NOTE Confidence: 0.88395999

00:19:47.390 --> 00:19:49.124 We're still at the early stages

NOTE Confidence: 0.88395999

00:19:49.124 --> 00:19:50.889 of trying to identify what these

NOTE Confidence: 0.88395999

00:19:50.889 --> 00:19:52.527 proteins are and how they relate

NOTE Confidence: 0.88395999

00:19:52.527 --> 00:19:54.367 to the time course of cancer

NOTE Confidence: 0.88395999

00:19:54.367 --> 00:19:55.912 to the progression to cancer.

NOTE Confidence: 0.88395999

00:19:55.920 --> 00:19:57.540 From the point of infection.

NOTE Confidence: 0.88395999

00:19:57.540 --> 00:19:59.634 But yes, I think that there's

NOTE Confidence: 0.88395999

00:19:59.634 --> 00:20:01.425 very much a possibility to

NOTE Confidence: 0.88395999

00:20:01.425 --> 00:20:03.399 intervene at a very early stage.

NOTE Confidence: 0.88395999

00:20:03.400 --> 00:20:06.586 If you do sort of a screen for such

NOTE Confidence: 0.88395999

00:20:06.586 --> 00:20:09.359 proteins at early points of infection,

NOTE Confidence: 0.88395999

00:20:09.360 --> 00:20:11.718 perhaps in in an ideal scenario.

NOTE Confidence: 0.88395999

00:20:11.720 --> 00:20:13.715 In a case of a childhood infection,

NOTE Confidence: 0.88395999

00:20:13.720 --> 00:20:14.338 for example,

NOTE Confidence: 0.88395999

00:20:14.338 --> 00:20:16.810 and if you see this sort of indication,

NOTE Confidence: 0.88395999

00:20:16.810 --> 00:20:18.165 then intervene at that point

NOTE Confidence: 0.88395999

00:20:18.165 --> 00:20:19.838 with these drugs that I mentioned

NOTE Confidence: 0.88395999

00:20:19.838 --> 00:20:21.693 might be down the line to kind

NOTE Confidence: 0.88395999

00:20:21.693 --> 00:20:23.259 of inhibit the activity that

NOTE Confidence: 0.88395999

00:20:23.259 --> 00:20:24.884 could lead to tumor development.

NOTE Confidence: 0.900209485555556

00:20:25.050 --> 00:20:26.825 You know you mentioned that

NOTE Confidence: 0.900209485555556

00:20:26.825 --> 00:20:28.245 half the world's population.

NOTE Confidence: 0.900209485555556

00:20:28.250 --> 00:20:30.608 Actually carry this Helicobacter pylori in

NOTE Confidence: 0.900209485555556

00:20:30.608 --> 00:20:33.428 our stomachs and for the majority of us.

NOTE Confidence: 0.900209485555556

00:20:33.430 --> 00:20:36.489 Thank goodness we never have any problems.

NOTE Confidence: 0.900209485555556

00:20:36.490 --> 00:20:38.932 There's a subset that get ulcers

NOTE Confidence: 0.900209485555556

00:20:38.932 --> 00:20:41.462 and a subset even smaller that

NOTE Confidence: 0.900209485555556

00:20:41.462 --> 00:20:43.904 that goes on to get cancer.

NOTE Confidence: 0.900209485555556

00:20:43.910 --> 00:20:47.070 And I wonder whether.

NOTE Confidence: 0.900209485555556

00:20:47.070 --> 00:20:50.969 The latter subset who get cancer is

NOTE Confidence: 0.900209485555556

00:20:50.969 --> 00:20:54.968 a subset who actually get ulcers

NOTE Confidence: 0.900209485555556

00:20:54.970 --> 00:20:58.750 versus they can get cancer without

NOTE Confidence: 0.900209485555556

00:20:58.750 --> 00:21:01.270 having that intervening gastritis,

NOTE Confidence: 0.900209485555556

00:21:01.270 --> 00:21:03.450 inflammation, kind of phase.

NOTE Confidence: 0.900209485555556

00:21:03.450 --> 00:21:05.085 In other words,

NOTE Confidence: 0.900209485555556

00:21:05.090 --> 00:21:09.908 if I have an asymptomatic infection with H.

NOTE Confidence: 0.900209485555556

00:21:09.908 --> 00:21:12.224 Pylori and I just carry this,

NOTE Confidence: 0.900209485555556

00:21:12.230 --> 00:21:14.378 but it never really bothers me.

NOTE Confidence: 0.900209485555556

00:21:14.380 --> 00:21:16.445 Am I at the same risk of

NOTE Confidence: 0.900209485555556

00:21:16.445 --> 00:21:17.330 getting gastric cancer?

NOTE Confidence: 0.900209485555556

00:21:17.330 --> 00:21:19.815 As a result of carrying that bug,

NOTE Confidence: 0.900209485555556

00:21:19.820 --> 00:21:23.360 as I would be if I not only carried H.

NOTE Confidence: 0.900209485555556

00:21:23.360 --> 00:21:24.536 Pylori but that H.

NOTE Confidence: 0.900209485555556

00:21:24.536 --> 00:21:26.700 Pylori went on to give me gastritis

NOTE Confidence: 0.900209485555556

00:21:26.700 --> 00:21:29.316 and ulcers and so on and so forth.

NOTE Confidence: 0.900209485555556

00:21:29.320 --> 00:21:31.600 And then I get gastric cancer.

NOTE Confidence: 0.900209485555556

00:21:31.600 --> 00:21:32.730 Do you understand my question?

NOTE Confidence: 0.926779655

00:21:33.720 --> 00:21:34.672 Yeah, I think so.

NOTE Confidence: 0.926779655

00:21:34.672 --> 00:21:36.679 And I should note again that I'm not

NOTE Confidence: 0.926779655

00:21:36.679 --> 00:21:38.808 a clinician, so this is certainly

NOTE Confidence: 0.926779655

00:21:38.808 --> 00:21:41.220 not my my area of expertise.

NOTE Confidence: 0.926779655

00:21:41.220 --> 00:21:42.744 But I will say my understanding

NOTE Confidence: 0.926779655

00:21:42.744 --> 00:21:44.379 is that the latter holds true,

NOTE Confidence: 0.926779655

00:21:44.380 --> 00:21:47.194 so those individuals who do develop ulcers.

NOTE Confidence: 0.926779655

00:21:47.200 --> 00:21:48.720 You know, chronic inflammation.

NOTE Confidence: 0.926779655

00:21:48.720 --> 00:21:51.388 Gastritis are the subset that are at

NOTE Confidence: 0.926779655

00:21:51.388 --> 00:21:52.998 greater risk for developing cancer

NOTE Confidence: 0.926779655

00:21:52.998 --> 00:21:55.422 down the line and the the model in

NOTE Confidence: 0.926779655

00:21:55.422 --> 00:21:57.521 the field is that each pylori induces

NOTE Confidence: 0.926779655

00:21:57.521 --> 00:22:00.407 infection in some host induces this

NOTE Confidence: 0.926779655

00:22:00.407 --> 00:22:02.601 chronic inflammation and in some

NOTE Confidence: 0.926779655

00:22:02.601 --> 00:22:04.967 hosts and some humans who have the.

NOTE Confidence: 0.926779655

00:22:04.970 --> 00:22:06.746 The microbe overtime that leads to

NOTE Confidence: 0.926779655

00:22:06.746 --> 00:22:08.277 the development of this inflammation

NOTE Confidence: 0.926779655

00:22:08.277 --> 00:22:10.314 in the tissue and that process is

NOTE Confidence: 0.926779655

00:22:10.314 --> 00:22:12.054 what seeds the development of the

NOTE Confidence: 0.926779655

00:22:12.054 --> 00:22:14.060 cancer decades down the line as well.

NOTE Confidence: 0.926779655

00:22:14.060 --> 00:22:15.810 So it does correlate strongly

NOTE Confidence: 0.926779655

00:22:15.810 --> 00:22:17.661 with the incidence of inflammation

NOTE Confidence: 0.926779655

00:22:17.661 --> 00:22:19.977 and people who have each pylori

NOTE Confidence: 0.894218916666667

00:22:20.230 --> 00:22:21.994 and that makes so much sense because

NOTE Confidence: 0.894218916666667

00:22:21.994 --> 00:22:24.008 we've seen that in other cancers as well,

NOTE Confidence: 0.894218916666667

00:22:24.010 --> 00:22:27.226 where it really is. This inflammation,

NOTE Confidence: 0.894218916666667

00:22:27.230 --> 00:22:29.030 the damage to the tissues.

NOTE Confidence: 0.894218916666667

00:22:29.030 --> 00:22:32.276 This idea that you get inflammation?

NOTE Confidence: 0.894218916666667

00:22:32.280 --> 00:22:33.750 You get fibrosis.

NOTE Confidence: 0.894218916666667

00:22:33.750 --> 00:22:36.246 You get free radicals.

NOTE Confidence: 0.894218916666667

00:22:36.246 --> 00:22:40.580 You you get, you know, an area of

NOTE Confidence: 0.894218916666667

00:22:40.580 --> 00:22:46.178 tissue which is not as well perfused.

NOTE Confidence: 0.894218916666667

00:22:46.180 --> 00:22:49.245 That can lead then to

NOTE Confidence: 0.894218916666667

00:22:49.245 --> 00:22:51.860 cancers and and so you know,

NOTE Confidence: 0.894218916666667

00:22:51.860 --> 00:22:54.350 presumably the tests that you're

NOTE Confidence: 0.894218916666667

00:22:54.350 --> 00:22:57.252 developing to look at these these

NOTE Confidence: 0.894218916666667

00:22:57.252 --> 00:22:59.312 infections might be something that

NOTE Confidence: 0.894218916666667

00:22:59.312 --> 00:23:02.466 very easily could be done at the time

NOTE Confidence: 0.894218916666667

00:23:02.466 --> 00:23:04.614 that somebody presents for a biopsy.

NOTE Confidence: 0.894218916666667

00:23:04.620 --> 00:23:05.895 Diagnosing the H.

NOTE Confidence: 0.894218916666667

00:23:05.895 --> 00:23:08.445 Pylori to begin with when they

NOTE Confidence: 0.894218916666667

00:23:08.445 --> 00:23:11.117 they have symptoms of gastritis.

NOTE Confidence: 0.894218916666667

00:23:11.120 --> 00:23:12.604 The next question is,

NOTE Confidence: 0.894218916666667

00:23:12.604 --> 00:23:16.121 you know if we know that it is the

NOTE Confidence: 0.894218916666667

00:23:16.121 --> 00:23:18.539 case that you know these gastric

NOTE Confidence: 0.894218916666667

00:23:18.539 --> 00:23:21.349 cancers tend to emerge in an area

NOTE Confidence: 0.894218916666667

00:23:21.349 --> 00:23:23.950 of inflammation and we we can kind

NOTE Confidence: 0.894218916666667

00:23:23.950 --> 00:23:26.400 of see in your research and that

NOTE Confidence: 0.894218916666667

00:23:26.481 --> 00:23:28.767 of others that the the pathway

NOTE Confidence: 0.894218916666667

00:23:28.767 --> 00:23:31.286 seems to be these free radicals.

NOTE Confidence: 0.894218916666667

00:23:31.286 --> 00:23:34.737 These small molecules and and damage to

NOTE Confidence: 0.894218916666667

00:23:34.737 --> 00:23:37.578 proteins and an inflammatory response,

NOTE Confidence: 0.894218916666667

00:23:37.580 --> 00:23:40.256 and so on and so forth.

NOTE Confidence: 0.894218916666667

00:23:40.260 --> 00:23:43.062 With your chemical toolbox where you're

NOTE Confidence: 0.894218916666667

00:23:43.062 --> 00:23:45.670 looking at these altered proteins.

NOTE Confidence: 0.894218916666667

00:23:45.670 --> 00:23:48.046 Have you looked at that in

NOTE Confidence: 0.894218916666667

00:23:48.046 --> 00:23:49.630 other cancers as well,

NOTE Confidence: 0.894218916666667

00:23:49.630 --> 00:23:53.302 and isn't necessarily the case that

NOTE Confidence: 0.894218916666667

00:23:53.302 --> 00:23:57.079 these are always related to microbes?

NOTE Confidence: 0.894218916666667

00:23:57.080 --> 00:24:00.223 Or is it possible that some inflammation

NOTE Confidence: 0.894218916666667

00:24:00.223 --> 00:24:03.068 may be due to other causes,

NOTE Confidence: 0.894218916666667

00:24:03.070 --> 00:24:05.090 but that the end pathway,

NOTE Confidence: 0.894218916666667

00:24:05.090 --> 00:24:07.346 the end result in terms of the small

NOTE Confidence: 0.894218916666667

00:24:07.346 --> 00:24:08.966 molecules and the tissue damage

NOTE Confidence: 0.894218916666667

00:24:08.966 --> 00:24:11.034 and the protein damage, et cetera?

NOTE Confidence: 0.894218916666667

00:24:11.034 --> 00:24:13.638 With the inflammatory response is the same?

NOTE Confidence: 0.734896546666667

00:24:15.500 --> 00:24:17.004 That's a great observation.

NOTE Confidence: 0.734896546666667

00:24:17.004 --> 00:24:19.566 And yes, I think it is very likely to

NOTE Confidence: 0.734896546666667

00:24:19.566 --> 00:24:22.428 be the case that a lot of these same

NOTE Confidence: 0.734896546666667

00:24:22.428 --> 00:24:24.600 protein damage pathways are are shared

NOTE Confidence: 0.734896546666667

00:24:24.600 --> 00:24:26.880 or are common amongst other cancers.

NOTE Confidence: 0.734896546666667

00:24:26.880 --> 00:24:28.910 We specifically, my lab specifically

NOTE Confidence: 0.734896546666667

00:24:28.910 --> 00:24:31.565 has not looked at other non

NOTE Confidence: 0.734896546666667

00:24:31.565 --> 00:24:33.239 infection associated cancers,

NOTE Confidence: 0.734896546666667

00:24:33.240 --> 00:24:35.526 but other labs have begun looking

NOTE Confidence: 0.734896546666667

00:24:35.526 --> 00:24:37.890 at this question and have certainly

NOTE Confidence: 0.734896546666667

00:24:37.890 --> 00:24:40.578 done it in other contexts as well,

NOTE Confidence: 0.734896546666667

00:24:40.580 --> 00:24:43.793 and I think that there will be an emerging

NOTE Confidence: 0.734896546666667

00:24:43.793 --> 00:24:46.658 picture of some proteins that get damaged.

NOTE Confidence: 0.734896546666667

00:24:46.660 --> 00:24:49.135 By inflammation and oxidative stress

NOTE Confidence: 0.734896546666667

00:24:49.135 --> 00:24:52.554 and variety of contexts and that these

NOTE Confidence: 0.734896546666667

00:24:52.554 --> 00:24:54.719 may provide very important clues

NOTE Confidence: 0.734896546666667

00:24:54.719 --> 00:24:57.799 for the risk of cancer development,

NOTE Confidence: 0.734896546666667

00:24:57.800 --> 00:25:00.064 and I should also mention that one thing

NOTE Confidence: 0.734896546666667

00:25:00.064 --> 00:25:02.648 that we haven't touched on is DNA damage,

NOTE Confidence: 0.734896546666667

00:25:02.650 --> 00:25:04.324 which is perhaps the more well

NOTE Confidence: 0.734896546666667

00:25:04.324 --> 00:25:06.359 known target of these oxidants that

NOTE Confidence: 0.734896546666667

00:25:06.359 --> 00:25:08.079 are generated during inflammation.

NOTE Confidence: 0.734896546666667

00:25:08.080 --> 00:25:10.336 And that's something that is certainly

NOTE Confidence: 0.734896546666667

00:25:10.336 --> 00:25:12.702 very common across many different types

NOTE Confidence: 0.734896546666667

00:25:12.702 --> 00:25:15.488 of cancers resulting from infection or not.

NOTE Confidence: 0.734896546666667

00:25:15.490 --> 00:25:17.346 Oxidants can damage DNA.

NOTE Confidence: 0.734896546666667

00:25:17.346 --> 00:25:17.810 Directly,

NOTE Confidence: 0.734896546666667

00:25:17.810 --> 00:25:20.106 and that can lead to mutations and

NOTE Confidence: 0.734896546666667

00:25:20.106 --> 00:25:22.378 instability of the genome that ultimately

NOTE Confidence: 0.734896546666667

00:25:22.378 --> 00:25:24.814 helps seed cancer formation as well.

NOTE Confidence: 0.895731788571429

00:25:25.730 --> 00:25:28.047 Yeah, the the problem with that though,

NOTE Confidence: 0.895731788571429

00:25:28.050 --> 00:25:29.690 is that as you mentioned,

NOTE Confidence: 0.895731788571429

00:25:29.690 --> 00:25:31.573 the nice thing about proteins is that

NOTE Confidence: 0.895731788571429

00:25:31.573 --> 00:25:33.467 potentially you can do something about it.

NOTE Confidence: 0.895731788571429

00:25:33.470 --> 00:25:35.950 So are people looking at, you know,

NOTE Confidence: 0.895731788571429

00:25:35.950 --> 00:25:38.225 trying to figure out how you can

NOTE Confidence: 0.895731788571429

00:25:38.230 --> 00:25:41.780 manipulate the system so that.

NOTE Confidence: 0.895731788571429

00:25:41.780 --> 00:25:44.237 You can kind of counteract DNA damage.

NOTE Confidence: 0.895731788571429

00:25:44.240 --> 00:25:45.465 My perception is that that's

NOTE Confidence: 0.895731788571429

00:25:45.465 --> 00:25:46.690 a little bit more difficult.

NOTE Confidence: 0.854536632

00:25:47.820 --> 00:25:49.724 I think you're right. Yeah, I'm not.

NOTE Confidence: 0.854536632

00:25:49.724 --> 00:25:51.908 I'm not familiar with specific work in

NOTE Confidence: 0.854536632

00:25:51.908 --> 00:25:54.757 that area, and I think it's it's a very

NOTE Confidence: 0.854536632

00:25:54.757 --> 00:25:56.929 important point that the benefit the

NOTE Confidence: 0.854536632

00:25:56.929 --> 00:25:59.213 advantage to looking at proteins, which

NOTE Confidence: 0.854536632

00:25:59.213 --> 00:26:01.877 is still a very emerging area of research,

NOTE Confidence: 0.854536632

00:26:01.880 --> 00:26:03.889 is that you have the opportunity to

NOTE Confidence: 0.854536632

00:26:03.889 --> 00:26:05.900 intervene and actually do something about it.

NOTE Confidence: 0.854536632

00:26:05.900 --> 00:26:08.630 And they also have the added advantage

NOTE Confidence: 0.854536632

00:26:08.630 --> 00:26:10.974 of being both diagnostic indicators

NOTE Confidence: 0.854536632

00:26:10.974 --> 00:26:13.709 or providing some some clues.

NOTE Confidence: 0.854536632

00:26:13.710 --> 00:26:15.310 What might be to come down the line,

NOTE Confidence: 0.854536632

00:26:15.310 --> 00:26:17.795 but also an opportunity to

NOTE Confidence: 0.854536632

00:26:17.795 --> 00:26:19.286 intervene through drugs?

NOTE Confidence: 0.854536632

00:26:19.290 --> 00:26:20.730 Small molecule approaches to

NOTE Confidence: 0.854536632

00:26:20.730 --> 00:26:22.170 help alter these outcomes?

NOTE Confidence: 0.854536632

00:26:22.170 --> 00:26:22.970 So I think for us,

NOTE Confidence: 0.854536632

00:26:22.970 --> 00:26:24.835 that's why there's such an

NOTE Confidence: 0.854536632

00:26:24.835 --> 00:26:26.327 exciting area of research,

NOTE Confidence: 0.854536632

00:26:26.330 --> 00:26:28.316 particularly as they relate to microbes.

NOTE Confidence: 0.836187924705882

00:26:28.550 --> 00:26:31.262 Yeah, you know, as you were talking about

NOTE Confidence: 0.836187924705882

00:26:31.262 --> 00:26:34.366 kind of these pathways and the way that H.

NOTE Confidence: 0.836187924705882

00:26:34.370 --> 00:26:37.010 Pylori works in terms of

NOTE Confidence: 0.836187924705882

00:26:37.010 --> 00:26:39.492 gastric cancer by you know,

NOTE Confidence: 0.836187924705882

00:26:39.492 --> 00:26:42.015 kind of getting the immune system to

NOTE Confidence: 0.836187924705882

00:26:42.015 --> 00:26:44.589 respond to it and then creating these.

NOTE Confidence: 0.836187924705882

00:26:44.590 --> 00:26:48.706 Small molecules and inflammation and so on.

NOTE Confidence: 0.836187924705882

00:26:48.710 --> 00:26:50.859 It. It made me think about other

NOTE Confidence: 0.836187924705882

00:26:50.859 --> 00:26:53.728 infections that we know also cause cancer,

NOTE Confidence: 0.836187924705882

00:26:53.730 --> 00:26:56.844 but that are not bacterial so we know H.

NOTE Confidence: 0.836187924705882

00:26:56.850 --> 00:26:59.265 Pylori is a is a little bacterium

NOTE Confidence: 0.836187924705882

00:26:59.265 --> 00:27:01.329 that lives in our stomachs.

NOTE Confidence: 0.836187924705882

00:27:01.330 --> 00:27:03.899 But we also know that many other

NOTE Confidence: 0.836187924705882

00:27:03.899 --> 00:27:05.869 cancers are caused by viruses.

NOTE Confidence: 0.836187924705882

00:27:05.870 --> 00:27:09.806 So thinking about hepatitis, for example,

NOTE Confidence: 0.836187924705882

00:27:09.810 --> 00:27:12.225 the pathway seems to be very similar

NOTE Confidence: 0.836187924705882

00:27:12.225 --> 00:27:14.449 in terms of you know, creating.

NOTE Confidence: 0.836187924705882

00:27:14.449 --> 00:27:16.794 Inflammation and fibrosis and free

NOTE Confidence: 0.836187924705882

00:27:16.794 --> 00:27:19.720 radicals and so on and so forth.

NOTE Confidence: 0.836187924705882

00:27:19.720 --> 00:27:22.768 Is there a difference in terms

NOTE Confidence: 0.836187924705882

00:27:22.768 --> 00:27:25.675 of how bacteria and viruses work

NOTE Confidence: 0.836187924705882

00:27:25.675 --> 00:27:28.070 in terms of developing cancer?

NOTE Confidence: 0.836187924705882

00:27:28.070 --> 00:27:31.112 And is it possible for your

NOTE Confidence: 0.836187924705882

00:27:31.112 --> 00:27:33.420 research to potentially look at

NOTE Confidence: 0.836187924705882

00:27:33.420 --> 00:27:35.700 virally mediated cancers as well?

NOTE Confidence: 0.935146627894737

00:27:36.900 --> 00:27:39.455 Sure, I think that there are opportunities

NOTE Confidence: 0.935146627894737

00:27:39.455 --> 00:27:41.911 to apply similar approaches to viral

NOTE Confidence: 0.935146627894737

00:27:41.911 --> 00:27:44.509 infections that are associated with cancer.

NOTE Confidence: 0.935146627894737

00:27:44.510 --> 00:27:48.092 And of course a lot of viruses have been

NOTE Confidence: 0.935146627894737

00:27:48.092 --> 00:27:51.039 connected to very important malignancies,

NOTE Confidence: 0.935146627894737

00:27:51.040 --> 00:27:52.868 HPV, human papilloma virus,

NOTE Confidence: 0.935146627894737

00:27:52.868 --> 00:27:54.239 and cervical cancer.

NOTE Confidence: 0.935146627894737

00:27:54.240 --> 00:27:56.190 That's perhaps one of the

NOTE Confidence: 0.935146627894737

00:27:56.190 --> 00:27:57.656 most well known connections,

NOTE Confidence: 0.935146627894737

00:27:57.656 --> 00:27:59.136 but there are several others,

NOTE Confidence: 0.935146627894737

00:27:59.140 --> 00:28:02.056 like hepatitis C, Epstein Barr virus,

NOTE Confidence: 0.935146627894737

00:28:02.060 --> 00:28:04.358 and the link between viruses and

NOTE Confidence: 0.935146627894737

00:28:04.358 --> 00:28:06.500 cancer has been explored for

NOTE Confidence: 0.935146627894737

00:28:06.500 --> 00:28:09.992 quite a long time and a lot more is

NOTE Confidence: 0.935146627894737

00:28:09.992 --> 00:28:13.367 known about how viruses can engage with

NOTE Confidence: 0.935146627894737

00:28:13.367 --> 00:28:16.908 the human cell to to cause cancer.

NOTE Confidence: 0.935146627894737

00:28:16.910 --> 00:28:18.750 So some of the pathways may be similar,

NOTE Confidence: 0.935146627894737

00:28:18.750 --> 00:28:20.502 but we think that they may also be

NOTE Confidence: 0.935146627894737

00:28:20.502 --> 00:28:22.128 very distinct with regards to microbes,

NOTE Confidence: 0.935146627894737

00:28:22.130 --> 00:28:23.410 but at the same time,

NOTE Confidence: 0.935146627894737

00:28:23.410 --> 00:28:25.072 these approaches I think will be

NOTE Confidence: 0.935146627894737

00:28:25.072 --> 00:28:26.583 very valuable for assessing viral

NOTE Confidence: 0.935146627894737

00:28:26.583 --> 00:28:28.318 infections and finding common pathways.

NOTE Confidence: 0.815024364444444

00:28:29.040 --> 00:28:31.105 Doctor Stavroula Hatzios is an

NOTE Confidence: 0.815024364444444

00:28:31.105 --> 00:28:32.757 assistant professor of molecular,

NOTE Confidence: 0.815024364444444

00:28:32.760 --> 00:28:35.196 cellular and developmental biology and of

NOTE Confidence: 0.815024364444444

00:28:35.196 --> 00:28:38.120 chemistry at the Yale School of Medicine.

NOTE Confidence: 0.815024364444444

00:28:38.120 --> 00:28:40.280 If you have questions,

NOTE Confidence: 0.815024364444444

00:28:40.280 --> 00:28:42.361 the address is canceranswers@yale.edu

NOTE Confidence: 0.815024364444444

00:28:42.361 --> 00:28:45.127 and past editions of the program

NOTE Confidence: 0.815024364444444

00:28:45.127 --> 00:28:47.538 are available in audio and written

NOTE Confidence: 0.815024364444444

00:28:47.538 --> 00:28:48.498 form at yalecancercenter.org.

NOTE Confidence: 0.815024364444444

00:28:48.498 --> 00:28:51.042 We hope you'll join us next week to

NOTE Confidence: 0.815024364444444

00:28:51.042 --> 00:28:52.984 learn more about the fight against

NOTE Confidence: 0.815024364444444

00:28:52.984 --> 00:28:54.549 cancer here on Connecticut Public Radio.

NOTE Confidence: 0.815024364444444

00:28:54.607 --> 00:28:57.060 Funding for Yale Cancer Answers

NOTE Confidence: 0.815024364444444

00:28:57.060 --> 00:29:00.000 is provided by Smilow Cancer Hospital.